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# *PRAENOELAERHABDUS*, A NEW ENDEMIC GENUS OF CALCAREOUS NANNOPLANKTON FROM THE PANNONIAN BASIN

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**Abstract:** A typical monospecific association of calcareous nannoplankton has been observed in a number of boreholes from Pannonian sediments of Vojvodina (North Serbia). It was a new genus, *Praenoelaerhabdus*, that most resembled *Dictyococcites* Black 1967 and *Noelaerhabdus* Jerković 1970. The *Noelaerhabdus* is supposed to have descended from the *Praenoelaerhabdus* n. gen. The need is emphasized for a detailed explanation of the causes of endemicity among calcareous nannoplankton in the specific refreshened area of the Pannonian Basin.

**Key words:** calcareous nannoplankton, *Praenoelaerhabdus* n. gen., Pannonian, Serbia.

## Introduction

In Vojvodina (northern Republic of Serbia), while drilling for oil in compact lithified marl of the Pannonian stage (Upper Miocene), in a number of boreholes (Lasz-1, Mih-1, Mih-2, Mih-4, Mih-8) within a short distance in central Banat and SE Bačka (Tus-1, Tus-2, Tus-3, Tus-4, Tus-6), a monospecific association of calcareous nannoplankton was observed, very abundant in specimens from some samples (Fig. 1).

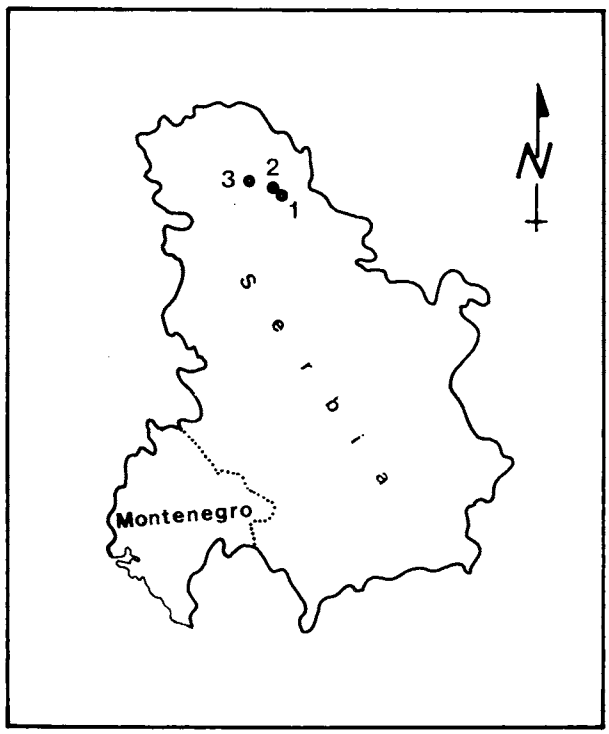


**Fig. 1.** Localities of boreholes in Vojvodina (1: Lazs-1; 2: Mih-1, Mih-2, Mih-4, Mih-8; 3: Tus-1, Tus-2, Tus-3, Tus-4, Tus-6).

*Praenoelaerhabdus* n. gen., as well as *Noelaerhabdus* Jerković 1970 and *Bekelithella* Bóna & Gál, was an endemic organism that has been found only in the Pannonian Basin. It existed in an aquatic environment of low salt content, in quite similar conditions as those prevailing at present in the Caspian Sea ("Caspibrackish Basin").

The explosion of new genera and species of calcareous nannoplankton was certainly caused by the atypical conditions of life which prevailed is an isolated area of the Pannonian Basin during the Pannonian. Specific morphologic features in the coccolith structure, particularly with *Noelaerhabdus* (atypical central process) and *Bekelithella* (several processes in circular arrangement on distal shield), and the evolutionary relations with other species of the calcareous nannoplankton, are questions which do not straight answers at present.

## Paleontological description

Family *Prinsiacea* Hay & Mohler 1967
Genus *Praenoelaerhabdus* n. gen.

Derivatio nominis: on the assumption that *Noelaerhabdus* Jerković 1970 descended from *Praenoelaerhabdus* n. gen.

Type species: *Praenoelaerhabdus banatensis* n. gen., n. sp.

Diagnosis: oval to subcircular placoliths. Proximal shield smaller than distal one. Shields composed of radial non-imbricate elements. All shield elements on the proximal side continue into the central area which is densely filled. Like the shields, the central area is oval to subcircular in the shape. Bars converge into a line which runs down the longer coccolith axis. Shield elements on the distal side steeply plunge into the central area. Wall is simple (without secondary cycle), composed of shield elements. Placolith central area composed of two elemental layers.

Remarks: *Praenoelaerhabdus* n. gen. differs from *Distyococcites* Black 1967 in having all shield elements extending into bars of the central area, and in having a secondary element cycle on

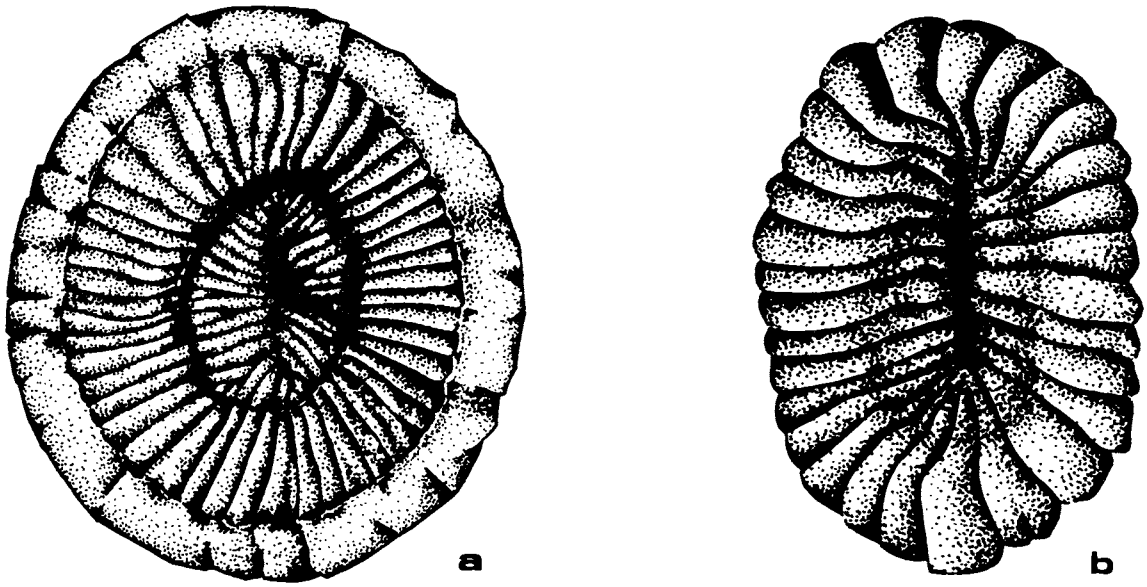


**Fig. 2.** *Praenoelaerhabdus banatensis* n. gen., n. sp.
**a** - proximal view (partly reconstructed holotype), magn. approx. x 14 200; **b** - distal view (partly reconstructed specimen in Pl. II, Fig. 1), magn. approx. x 21 300.

the distal side. From *Noelaerhabdus* Jerković 1970 it differs in not having the central process. The ridge down the longer axes of the central area, in *Noelaerhabdus*, from which the central process rises, is supposed to have been formed by the bar ends curving, which join into one line with *Praenoelaerhabdus*.

*Praenoelaerhabdus banatensis* n. gen., n. sp.
Text-fig. 2, Pl. I, Figs. 1 - 6; Pl. II, Figs. 1 - 16

part. 1985 ?*Noelaerhabdus tegulatus* n. sp. - Bóna & Gál, p. 487 - 488, Pl. 69, Fig. 2 (not Fig. 1); Pl. 77, Fig. 3

D e r i v a t i o n o m i n i s : after Banat, a region in Vojvodina.

H o l o t y p e : Pl. I, Fig. 1 (negative Univ. Lab. EM, No. 309/3).

L o c u s t y p i c u s : borehole Lazs-1, 1519 m.

S t r a t u m t y p i c u m : Pannonian (Upper Miocene).

P a r a t y p e : Pl. I, Figs. 2 - 5; Pl. II, Figs. 1 - 16, and thousands of specimens from the locus typicus.

D i a g n o s i s : oval to subcircular placolith. Proximal shield smaller than the distal one. Shields composed of nonimbricate elements (approx. from 30 to 44). Each element is without significant tapering into a bar. In the narrow central area on the proximal side, some bars are partly overlapped by others. Bars join into a line in direction of coccolith longer axis.

D i m e n s i o n s : approx. 3 to 6 microns.

R e m a r k s : *Praenoelaerhabdus banatensis* n. gen., n. sp., resembles ?*Noelaerhabdus tegulatus* Bóna & Gál, which is shown in indistinct illustrations (Bóna & Gál 1985). The species from the Pannonian of Hungary has a "brick-like" central area on distal side as its main characteristic. Many specimens from boreholes in Vojvodina show aggregations of calcite grains in the central area. In our opinion, the aggregations are a secondary feature associated with the processes of diagenesis. Bad photograph of poorly preserved specimen showing its proximal side (Pl. 69, Fig. 2) has similarity with the new species. Plate 77 (Fig. 3) shows the species ?*Noelaerhabdus tegulatus* in the light microscope with crossed nicols, where the similarity with the new species is noticeable.

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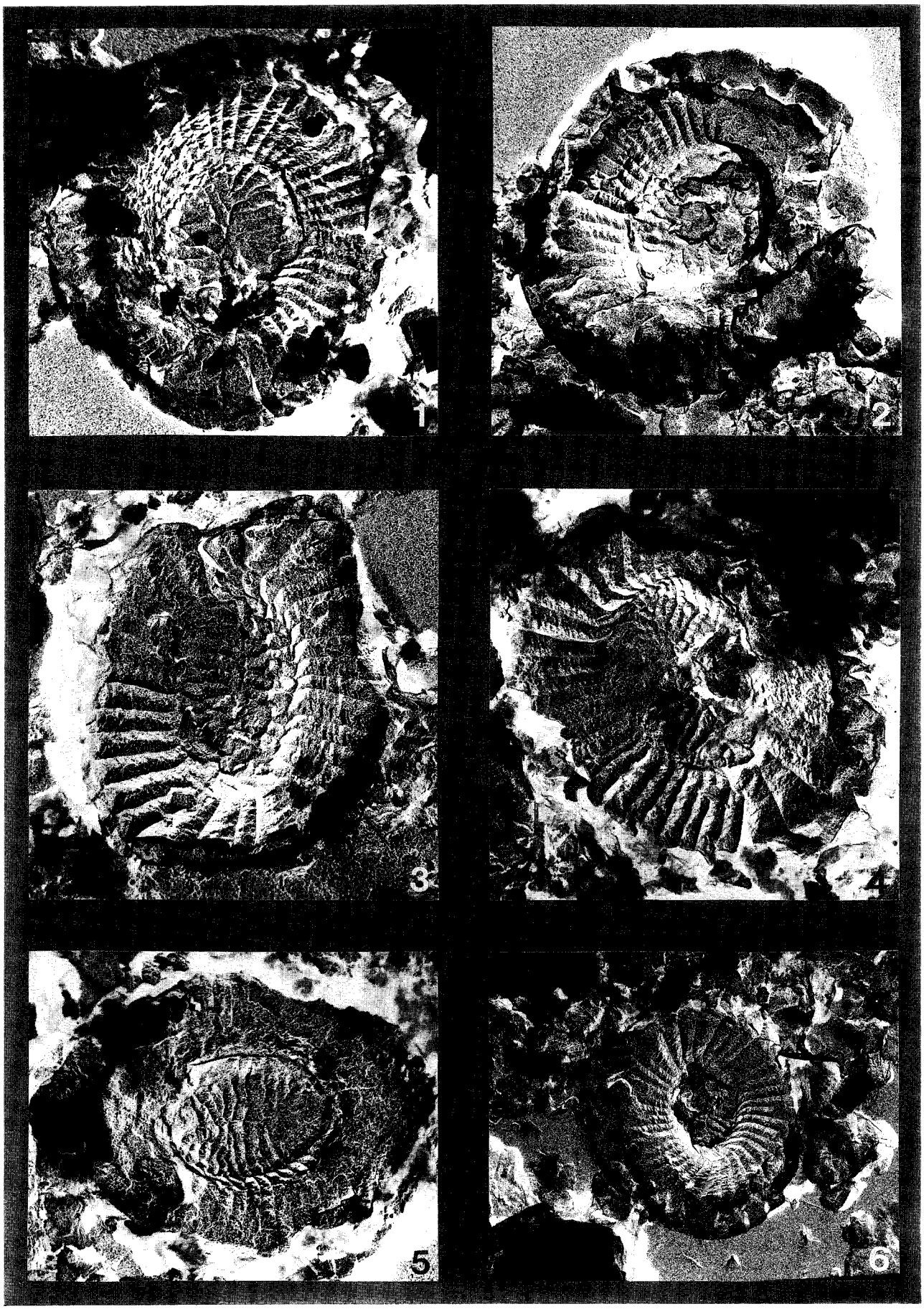
## References

Bóna J. & Gál M., 1985: Kalkige Nannoplankton im Pannonien Ungarns.In: Papp,A. (Ed.): *Miozän $M_6$ Pannonien, Chronostratigraphie und Neostratotypen. Akad. Kiadó*, Budapest, 482 - 515.

Jerković L., 1970: Noelaerhabdus nov. gen. type d' une nouvelle famillede Coccolithophorides fossiles: Noelaerhabdaceae du Miocene superieur de Yugoslavie. *C.R. Acad. Sc., Ser. D*, Paris, 270, 468 - 470.

**Plate I.** Figs. 1 - 6: *Praenoelaerhabdus banatensis* n. gen., n. sp. Proximal view. Figs. 1, 2, 4, 5: x 14 200; Fig. 3: x 17 900; Fig. 6: x 9 000. All figures transmission electron micrographs.

**Plate II.** Figs. 1 - 16: *Praenoelaerhabdus banatensis* n. gen., n. sp. Figs. 1, 2: x 14.000; Fig. 3: x 23.000; Fig. 4: x 17.900 (Figs. 1 - 3: distal view; Fig. 4: lateral view of partly destroyed specimen); Figs. 5 - 8, 10, 11, 13, 14: cross nicols; Figs. 9, 12: ordinary light; Fig. 15: cross nicols and Nomarsky differential contrast; Fig. 16: ordinary light and Nomarsky differential contrast (Figs. 7 - 9, Figs. 10 - 12, Figs. 13 - 16 are the same specimens). Figs. 1 - 4 transmission electron micrographs. Figs. 5 - 16 light micrographs (bar 5 microns).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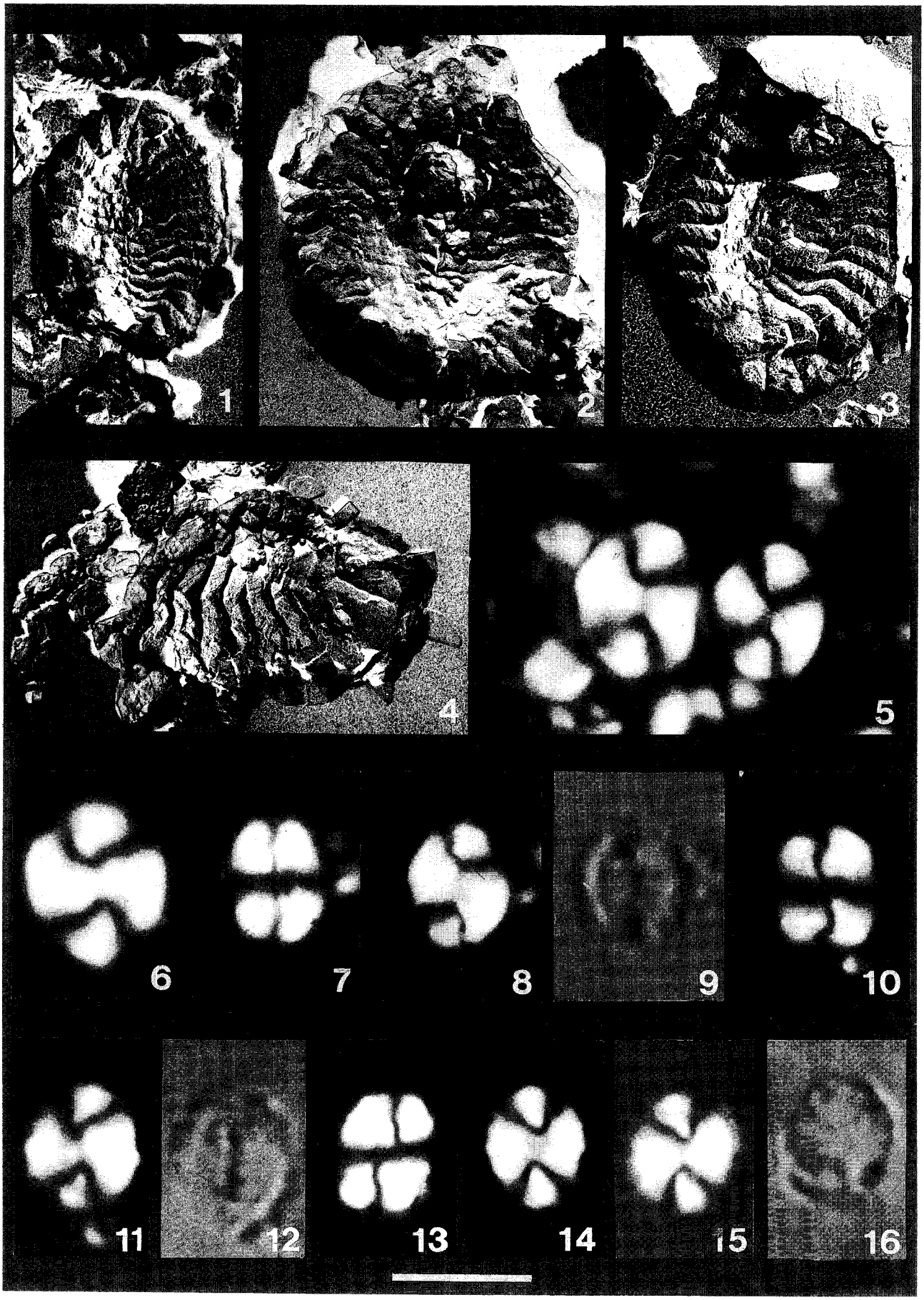
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